

**DNA DAMAGE AND CELL CYCLE PERTURBATIONS IN
ERYTHROCYTES OF THE FISH *CATLA CATLA* (Ham.) EXPOSED
TO GAMMA RADIATION**

S.Anbumani and Mary N. Mohankumar

Biodosimetry Laboratory, Radiological Safety Division,

Indira Gandhi Centre for Atomic Research

Kalpakkam 603102, Tamilnadu, India.

marynmk@igcar.gov.in, marynmk@rediffmail.com

Environmental mutagens such as ionizing radiation and chemicals induce DNA damage in a wide variety of organisms. The International Commission on Radiological Protection (ICRP) has recently emphasized the need to protect non-human biota from the potential effects of ionizing radiation. Radiation exposures to non-humans can occur as a result of low-level radioactive discharges into the environment. Molecular genetic effects at low-level radiation exposures are largely unexplored and systematic studies using sensitive biomarkers are required to assess DNA damage in representative non-human species. The objective of the present study is to detect DNA damage in the freshwater fish, *Catla catla* exposed to low (0.002Gy/min) and high dose rate (3.4Gy/min) gamma radiation using the Erythrocyte micronucleus (EMN) assay and flow cytometry (FCM). Peripheral blood samples from the caudal vein were collected at different intervals post exposure and subjected to EMN analysis. Along with MN, various nuclear and cytoplasmic abnormalities such as nuclear bud, lobed nucleus, nuclear bridges, vacuolated nucleus, apoptotic cells, anisochromasia, echinocytes, and vacuolated cytoplasm were observed. Increase in coefficient of variation (CV) values of the G0/G1 peak as potential indicators of DNA damage and cell cycle perturbations were explored. The EMN assay and FCM can be used to differentiate DNA damage caused by ionizing radiation and other chemicals. This study will highlight the effects of ionizing radiation at low dose exposures and the sensitivity of the assays involved.